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in the arts. Credit, speculation, banks, corporations, feverish pursuit of wealth, psychology — all these are accessory phenomena, to be subordinated in the exposition to the one dominant factor, the complex division of labor. The earlier chapters in this book, especially the chapters on the "Industrial Equilibrium," the "Organization of Industry" and the "Problem of Capital," take up this fundamental aspect of the problem; and they are in the main just and sound. Especially the last mentioned of these chapters, on the "Problem of Capital," in which the distribution of capital, the existence of unused or improperly used capital and the existence of gluts are severally examined, is sensible and judicial. Yet even here the reader misses a firm touch and a steady adherence to a guiding principle; and he would have been aided, if this part of the book had been more fully and consistently elaborated, even at the sacrifice of such subsequent matter as that on Rodbertus and socialism or the periodicity of crises and their relation to sun spots.

F. W. TAUSSIG.

HARVARD UNIVERSITY.

*Wages in the United Kingdom in the Nineteenth Century.*

Notes for the Use of Students of Social and Economic Questions.

By ARTHUR L. BOWLEY, M.A. Cambridge, University Press, 1900. — 148 pp.

For a number of years Mr. Bowley has been an earnest and indefatigable student of the history of wages in England. He has found innumerable records fragmentary and disjointed, and it has been his task to knit them together into a consecutive history. A few years ago he found the solution of the puzzle in what he terms the "kinetic method," an elaboration of the principles of the index number. In its elements not unknown before,<sup>1</sup> it is in its application to wages new with Mr. Bowley and will doubtless be known as his special contribution to the methods of statistics.

The "kinetic method" shares with the index number the purpose of measuring changes — the latter generally in prices, the former in wages. For such measurements of change in either field absolute accuracy in the original figures is not so essential as continuity in the series. Thus far there is no novelty of principle or treatment. This begins when Mr. Bowley seeks to weld into a common series statements dissimilar in origin and form. Possibly the best explanation of his procedure is an illustration which, it should be added,

<sup>1</sup> See the reviewer's "Wage Statistics in Theory and Practice," in *Publications of the American Statistical Association*, 1899.

deals with purely imaginary quantities. Suppose we have the following statements of carpenters' wages: London, 1885, 6s. daily; 1895, 6s. 8d. daily; and Chester, 1870, 28s. per week; 1885, 32s. per week. From these figures it is obvious that we can deduce the following ratios:

|               | 1870 | 1885 |              | 1885 | 1895 |
|---------------|------|------|--------------|------|------|
| Chester . . . | 100  | 114  | London . . . | 100  | 111  |

By placing the London figures for 1885 equal to the Chester figures of the same date we have the consecutive series:

| 1870 | 1885 | 1895 |
|------|------|------|
| 100  | 114  | 127  |

For a single occupation the method is comparatively simple, and with a sufficient number of partial series a well-nigh perfect series of ratios may be constructed. For a group of occupations Mr. Bowley does not adopt the plan of a simple or weighted average. In a former essay<sup>1</sup> he criticises the "Aldrich Report" because it seeks to estimate average change, while his problem is to estimate change of average wages. Hence he deems it necessary to express wages in terms of a single occupation. Thus, if we have at the base line bricklayers represented by 100, with wages of 12s. daily, and their helpers represented by 100, with wages of 6s. daily, he would reduce all figures for helpers by one-half before taking his average (pp. 91-2). A further preliminary to calculating an average is to ascertain for the years represented the relative numbers of each class employed, if not accurately, at least approximately, in order to obtain a system of weights. A combination of several groups, which is not attempted in the present volume, would require similar manipulations.

It has seemed necessary to explain at some length the general method pursued by the author, in order to understand the meaning and intention of the present work, which in its subtitle bears the modest designation, "Notes for the Use of Students of Economic and Social Questions." Mr. Bowley has become so enthusiastic over his method that he takes the public into his laboratory to see it in operation. The object of the volume is to exhibit the raw material and the early processes of treatment. With infinite industry Mr. Bowley has searched the existing wage records and selected the material which he deems suitable for his purpose. He shows us the selective process at work and also explains how he prepares his specimens.

<sup>1</sup> "Wages in the United States of America and Great Britain, 1860-1891," *Economic Journal*, 1895.

At a later day he promises to classify them into a system, and indeed frequently gives us hints as to how he proposes to do so.

In the present work Mr. Bowley's purpose is to find for different occupations consecutive wage records, based presumably upon the same principles, to give us as many series, however fragmentary, as possible. He holds that a person is liable to act in the same way on different occasions, so that, if a manufacturer reports wages to be 20s. at one time and 30s. at another, he may have in view the better class of workmen or the poorer class or the rate most frequently paid, but in both reports it will be the same. Whatever it may be, it will suffice to indicate the ratio of change. Before admitting any evidence Mr. Bowley scrutinizes it with extreme caution, seeking confirmation in other testimony. If the locality is not distinctive for the particular employment, he discards the testimony, unless a part, at least, is confirmed by that from the great centers of the industry. He carefully examines whether there is any part payment in kind, any allowances or any deductions. Not until he has satisfied himself upon these points does he admit the testimony. The field covered by this volume embraces wages in agriculture, in the textile industries, in the iron trades, in mining, in the building trades and in printing. For each Mr. Bowley selects the appropriate raw material, after methods which have been indicated.

While incomplete, the volume is the product of untiring industry and patient research. It brings only tentative conclusions, and its merit lies in its method rather than in its results. In showing how the crude figures of an earlier day may be utilized for scientific purposes, despite their imperfections, Mr. Bowley has performed a service for which the economist and the statistician should be duly grateful.

UNIVERSITY OF PENNSYLVANIA.

ROLAND P. FALKNER.

*The Modern Farmer in his Business Relations.* By EDWARD F. ADAMS. San Francisco, N. J. Stone Company, 1899.—602 pp.

A half century has sufficed to change the American farmer from a producer of commodities intended for his own use or for a local market to a producer on a large scale for the world's markets. The same period has likewise witnessed an immense improvement in the technical processes of agricultural production, especially through the introduction and almost universal use of agricultural machinery. Unfortunately for the farmer, his knowledge of the new markets and of the new methods of trading has not kept pace with this